

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

|   |   |  |
|---|---|--|
| Applicant's or agent's file reference<br>9480.0-01A   | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |  |
| International application No.<br>PCT/US03/02972   | International filing date (day/month/year)<br>31 January 2003 (31.01.2003)  | Priority date (day/month/year)<br>31 January 2002 (31.01.2002) |
| International Patent Classification (IPC) or national classification and IPC<br><br>IPC(7): C10C 3/00; H01M 4/02, 4/08, 4/24, 4/36. and US Cl.: 250/502, 511; 206/44; 264/29.1; 106/284.01; 429/231.8; 201/21, 24; 423/445R, 447.9, 448   |   |  |
| Applicant<br><br>CONOCOPHILLIPS COMPANY   |   |  |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>—</u> sheets.</p>  |   |  |
| <p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input checked="" type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p> |   |  |
| Date of submission of the demand<br><br>08 August 2003 (08.08.2003)   | Date of completion of this report<br><br>06 April 2004 (06.04.2004)   |  |
| Name and mailing address of the IPEA/US<br>Mail Stop PCT, Attn: IPEA/US<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, Virginia 22313-1450<br>Facsimile No. (703) 305-3230   | Authorized officer<br><br>Dr. Yogendra Gupta<br>Telephone No. 572-272-1700  |  |

Form PCT/IPEA/409 (cover sheet)(July 1998)

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**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☒ the international application as originally filed.
- ☒ the description:  
pages 1-65 \_\_\_\_\_ as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims:  
pages 66-74 \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings:  
pages 1-2 \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☐ the sequence listing part of the description:  
pages NONE \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/US03/02972**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

|                               |   |     |
|-------------------------------|---|-----|
| Novelty (N)                   | Claims <u>35-37, 54, 66-70</u>          | YES |
|                               | Claims <u>1-34, 38-53, 55-65, 71-72</u> | NO  |
| Inventive Step (IS)           | Claims <u>35-37, 54, 66-70</u>          | YES |
|                               | Claims <u>1-34, 38-53, 55-65, 71-72</u> | NO  |
| Industrial Applicability (IA) | Claims <u>1-72</u>                      | YES |
|                               | Claims <u>NONE</u>                      | NO  |

**2. CITATIONS AND EXPLANATIONS**

Please See Continuation Sheet

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

Claim 37 objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: Claim 37 improperly depends on itself and has been treated to be dependent on Claim 35 for the purposes of the examination. Appropriate correction needed.

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Claims 44-53, 65, 72 lack novelty under PCT Article 33(2) as being anticipated by Nippon (JP 09-231974A). Nippon teaches blending of 20-50 parts by wt of binder pitch and 100 parts by wt of specific coke powder with a particle size less than 10  $\mu\text{m}$  by kneading, compacting, air oxidation of the green material followed by graphitizing, the resulting product having a particle size of 5-30 micron and a surface area of 8  $\text{m}^2/\text{g}$  (Abstract). Nippon also teaches making of an electrode and a lithium battery (Table-3).

Claims 1, 5-11, 23-28, 30-34, 40-41, 55-64 and 71 lack an inventive step under PCT Article 33(3) as being obvious over Nippon (JP 09-231974A). The disclosure by Nippon is set forth as above and the process steps would have been obvious control steps known in the art.

Claims 44-53 lack novelty under PCT Article 33(2) as being anticipated by Hayashi et al (US 5,906,900). Hayashi et al teach a composite carbonaceous material in which to the surface of a graphite-like carbonaceous material is attached a carbonized material and the methods to make the coated carbonaceous material with low surface area and their use in non-aqueous electrodes/batteries. Graphite-like carbonaceous material with a particle size of less than 30  $\mu\text{m}$  was mixed with fusible/soluble organic or thermosetting polymer using organic solvents, and the coated material was heated step-wise up to 300°C under inert atmosphere or vacuum effecting carbonization and graphitization. The nonaqueous battery showed good charging and discharging efficiencies. (Abstract, Col-2, Ln: 12-40; Col-3, Ln-6 to Col-10, Ln-37; Col-11. Example-1; Col-19, Table-2).

Claims 1-34, 38-43, 55-65 and 71-72 lack an inventive step under PCT Article 33(3) as being obvious over Hayashi et al (US 5,906,900) in view of Asano et al (US 4,042,486) and further in view of Asano et al (US 4,293,533). The disclosure by Hayashi et al on the coated carbon, process of coating and the electrode/battery is set forth as above. Asano et al (US 4,042,486) teaches coating the surface of raw pitch particles with a thermosetting resin, wet/dry oxidation of the surface coating and carbonization in non-oxidative atmosphere (Col-3, Ln-17 to Col-6, Ln-17). Asano et al (US 4,293,533) teaches coating the surface of a raw pitch particles of diameter less than 50  $\mu\text{m}$  with an organic using a solvent followed by carbonization and optional graphitization forming coated product of either low or highly graphitized nature (Col-1, Ln: 45-55; Col-2, Ln: 64-68; Col-3, Ln-4 to Col-4, Ln-30).

Claims 1, 5-11, 23-28, 30-34, 40-41, 44-53 and 65 lack novelty under PCT Article 33(2) as being anticipated by Osaka (JP 11-246209A). Osaka teaches coating of isotropic pitch on graphite/hard-carbon surface by dipping, oxidation of pitch

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

in air, carbonization in inert atmosphere producing a coated carbonaceous material with a surface area less than 3 m<sup>2</sup>/g and the use of the material as negative electrode material for lithium secondary cell with good discharge capabilities (Abstract, Table-1).

Claims 1, 5-11, 23-25, 44-49 and 65 lack novelty under PCT Article 33(2) as being anticipated by NKK (JP 01-305859A). NKK teaches making of high-density carbon material for electrodes by mixing graphite powder with coal tar pitch, pulverizing the mixture, further subjecting to oxidation treatment, then molding the mixture followed by carbonization and graphitization (Abstract).

Claims 26-28, 30-34, 40-43 lack an inventive step under PCT Article 33(3) as being obvious over NKK (JP 01-305859A) in view of Nippon (JP 09-231974A). The disclosure by NKK and Nippon are set forth as above and the particle size of the carbon and the use of various oxidants in the manufacture of coated carbon are well known in the art.

Claims 35-37, 54, 66-70 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the use of solid oxidants, mixing of the two solutions at an elevated temperature and the partial coating of the particles per the limitations of the instant claims by the applicants.

Claims 1-72 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----